Case Report

Uniocular Blindness Following Thermal Injury

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Abstract

A hot water burn is a thermal injury that results in cell death. Thermal eye injury triggers inflammatory processes, including inflammatory cell influx and/or the activation of various inflammatory cells, which result in the rapid accumulation of extravascular fluid in the ocular tissue. The ocular effect depends on the temperature of the water, and the final visual outcome depends on the severity of the damage to the intraocular structures. We report a 23-year-old woman who experienced a facial hot water burn that resulted in blindness. The patient presented late to the hospital after the unsuccessful use of traditional medication. Facial burns are a known cause of blindness. Public health education on prompt hospital presentation, and resistance to the use of potentially harmful traditional medicine in facial burns is suggested.

Keywords: *herpes zoster ophthalmicus, hot water burn, traditional eye medication*

Introduction

Hot water facial scalding leading to blindness is rare among adults. However, it can result from assault and accidents (1). A hot water burn is a thermal injury, and direct contact with the eye may result in blindness if not properly managed. The thermal burn causes superficial epithelium cell death, although thermal necrosis and penetration can occur (1,2). Thermal eye injury triggers an inflammatory response by various inflammatory cells, which results in the rapid accumulation of extravascular fluid in the ocular tissue (3). The ocular effect depends on the temperature of the water, and the final visual outcome depends on many factors, including the promptness of presentation to the hospital (1), severity of the burn, application of traditional medication (4–8), and available expertise. This paper reports a 23-year-old woman who sustained a facial or ocular scald, used traditional medication and presented late to the hospital, resulting in uniocular blindness.

Case Report

A 23-year-old breast-feeding mother presented to our hospital following a facial hot water injury that occurred three days prior. The bucket of hot water she was carrying to the bathroom fell, and the hot water splashed into her face. She experienced associated; facial pain and swelling, and right eye (RE) symptoms including pain, redness, tearing, photophobia, and a reduction in vision. She enjoyed good vision bilaterally prior to the incident. She immediately irrigated her face with water, and approximately five minutes later, she applied traditional medication (TM) to her face and RE. Two days after the incident, she noticed RE discharge and very poor vision. The patient had no significant past medical or ocular history. At the time of presentation to the accident and emergency (A&E) unit, the medical officer on duty admitted the patient for an ophthalmologist review, as a case of herpes zoster ophthalmicus (HZO). A general examination revealed a depressed young woman, who was afebrile with a facial scald (mainly right hemifacial) that was covered by black concoction extending from her forehead to her chin (Figure 1). An ocular examination demonstrated that her visual acuity (VA) was counting fingers (CF) in the RE and 6/6 in the left eye (LE). The RE showed the presence of lid scald/periorbital edema, complete mechanical ptosis, purulent eye discharge, diffuse conjunctival hyperemia, 180 degree limbal ischemia (3–9 o'clock), a hazy cornea, a normal anterior chamber depth, a

glimpse of round pupil and iris, and a poor view of the fundus. A slit lamp examination revealed a central corneal ulcer approximately 4 mm in diameter. Her left eye (LE) was essentially normal. A diagnosis of a right-sided superficial facial hot water burn with RE involvement was made. All of the laboratory investigations, including a full blood count and fasting blood sugar, revealed no abnormalities. Right eye swab microscopy, culture, and sensitivity were not remarkable. The patient was admitted, and facial debridement was performed. The patient was treated with intravenous ciproxin, 200 mg every 12 hours for 48 hours, and metronidazole, 500 mg every 8 hours for 48 hours. Anti-tetanus serum (750 IU) was also administered intramuscularly. Additionally, the patient was treated with guttae atropine (1%) every 12 hours, ciprofloxacin every 4 hours, flurbiprofen every 6 hours and chloramphenicol eye ointment. Furthermore, the patient received tablet cataflam, 50 mg every 12 hours for 5 days, and ascorbic acid, 100 mg every 8 hours for 7 days. Dermacerine cream was applied to the facial wound every 6–8 hours for 10 days. At 48 hours after admission, the intravenous antibiotics were changed to oral antibiotics (tablet ciprotab, 500 mg every 12 hours, and metronidazole, 400 mg every 8 hours for one week). On the 3rd day after admission, the facial burn showed signs of healing, and the lid swelling had reduced, but there was still complete mechanical ptosis of the RE. An examination on the 5th day after admission revealed rapid healing of the facial burn with right lower lid ectropion, a reduced intensity of corneal staining with a red reflex, and a glimpse of a superior retina on fundoscopy (Figure 2). The ectropion was managed by plaster tapping.

The patient recovered well and was discharged two weeks after admission with an RE visual acuity of CF, diffuse central corneal opacity (Figure 3) and an intraocular pressure of 14 mmHg. The patient was lost to follow up following discharge.

Figure 1: The patient at presentation (3rd day after the scald).

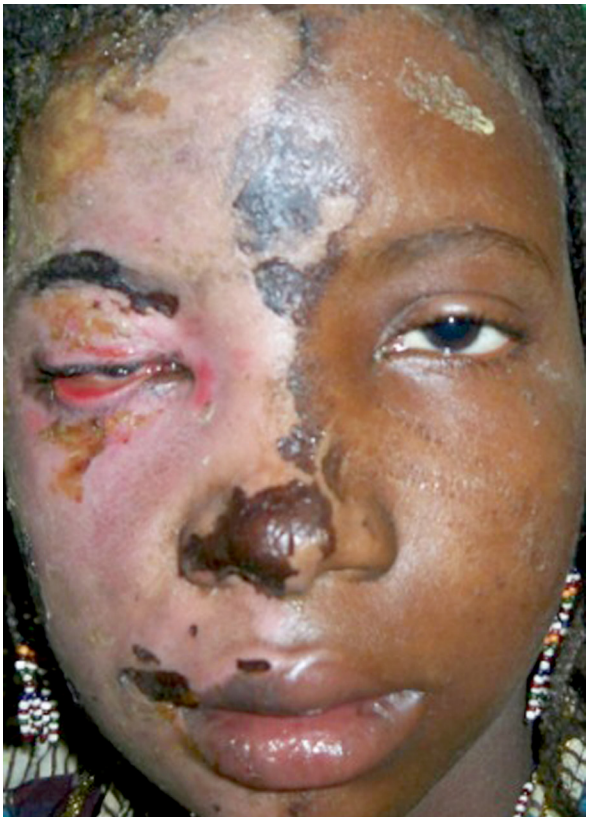

Figure 2: The patient on the 5th day following admission.

Figure 3: The patient at discharge (2 weeks of treatment).

Discussion

This paper reported a 23-year-old woman who sustained a facial or ocular burn leading to uniocular blindness. An ocular burn is an ophthalmic emergency (9), whether it is a chemical or radiant injury, because rapid ocular tissue damage occurs. Radiant injuries can involve hot liquids, hot gases, molten metals, or ultraviolet rays. The severity of an ocular burn is related to the duration of exposure, and the offending agent. Burns inflict damage primarily by denaturing and coagulating tissue proteins, and secondarily through ischemic vascular damage. Typically, thermal burns are limited to the superficial epithelial cells, but thermal necrosis and penetration may occur (9).

The proportion of ocular burns among eye injuries ranges between 7%–18% (10), and eye injuries account for 3%–4% of all occupational injuries (11). Most (84%) are chemical burns, while thermal burns represent 16% of ocular burn cases. Approximately 15%–20% of facial burn cases have a secondary ocular injury. Burns are not age or gender specific, but younger age groups and males appear to be more at risk. These groups may be more exposed to/engaged in situations/vocations with a high risk for ocular injury.

It is of note that complications sometimes follow ocular burns, including eyelid contractures, conjunctivitis, corneal defects (epithelial defects/ulcer, conjunctival cells invasion, perforation, scarring), cataracts, raised intraocular pressure/glaucoma, retinal detachment and impaired vision/blindness (12,13).

The prognosis of an ocular burn depends on the depth of the injury. In mild to moderate cases, the outcome is good, while severe cases may require serious intervention, including corneal transplant or rehabilitation services (14). The major concerns with ocular burns are final visual acuity and cosmesis. With prompt treatment and early ophthalmologic intervention, thermal burns generally have good visual outcomes (9).

This case occurred during the cold season of harmattan, and it is a common practice among people to warm up 'harmattan cold' water with hot water for a bath. This case illustrates the typical rural management of health conditions, including hot water burns, and their ocular effects, in agreement with a previous report (2). Many health conditions are first managed with traditional medications, and orthodox care is only sought when the condition fails to improve or deteriorates. Early presentation would have improved the visual prognosis, and reduced the duration of hospital stay in this patient, as reported elsewhere (1). Additionally, this case illustrates the ocular effect of traditional eye medication (TEM), and agrees with similar studies in developing countries (4–8). The corneal ulcer may have been due to the hot water burn, the TEM or both. Although the eye swab test was not remarkable, an eye infection was suspected and managed due to the breach of the epithelium (from the burn), and possible inoculation with an infecting organism by TEM, which has been reported in various studies (4,5,8). The hemifacial affectation of the burn resulted in the inclusion of herpes zoster ophthalmicus in the differential diagnosis of this patient. However, a carefully taken medical history (clerking) should have assisted the medical officer in the A&E unit to correctly diagnose this patient even without any medical investigation. The right hemifacial affectation was remarkable, and it could be reasoned that the bucket containing hot water was carried with her right hand and was closer to the right side of her face when the accident occurred. Plaster tapping corrected the right lower lid ectropion. The anti-tetanus prophylaxis was justified in this

patient because of the epithelial breach by the burn and because TEM is potentially infectious. We lost the benefit of assessing the visual acuity in the affected right eye after discharge from the hospital because the patient was lost to follow up. Losing patients to follow up is a challenge to health care in our health facility and elsewhere (8). Nonetheless, should her visual acuity fail to improve, this patient may benefit from a corneal transplant in the future. However, judging from the patient's social indices, she may not have been bothered by the blindness in her right eye as long as her left eye remained visually functional. Even if an improvement in her right eye vision was desired, she may not have been able to afford the expenses without assistance. Such challenges face many across the globe who suffer from avoidable blindness.

Conclusion

In conclusion, the late presentation to the hospital and the use of traditional medicine led to blindness in this patient. Facial burns are a cause of blindness. The need for public health education on prompt hospital presentation and resistance to the use of potentially harmful traditional medicine in facial injuries is suggested. Precautionary measures against home accidents leading to facial burns would reduce avoidable blindness.

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Authors' Contributions

Conception and design, analysis and interpretation of the data, drafting and final approval of the article, critical revision of the article for important intellectual content, provision of study materials or patients, statistical expertise, obtaining of funding, administrative, technical or logistic support, and collection and assembly of data: AAA, MKF

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